

Granted based on the First Transition Law of 8 July 1949
(WiGBI, page 175)

FEDERAL REPUBLIC OF GERMANY



PUBLISHED ON
25 AUGUST 1952

GERMAN PATENT OFFICE

PATENT

No. 847 475

CLASS 30k GROUP 17 04

U 380 [IV] a/30k

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Device for Drainage of Wounds

Patented in the Federal Republic of Germany from 22 August 1944

The period from 8 May 1945 through 7 May 1950 is not counted as patent time

(Law of 7/15/51)

Patent Application announced on 31 October 1951

Patent granting announced on 26 June 1952

The use of rubber sponges to protect secreting (fluid-secreting) or purulent wounds is known. It has turned out that slight pressure is mildly exerted on the interior of the wound and existing recesses are developed; fluid secretions of the wound are also absorbed to a certain degree by the absorption capacity of the sponge; because of this, it is often possible to achieve a beneficial effect on healing.

A drawback of the sponge tampons, however, is that suction of the wound secretion only occurs to a limited extent and, during longer lying in bed, smaller or larger accumulations of fluids can form, especially on the base of the wound, which are capable of delaying healing and sometimes completely preventing it. Thus far sponge rubber tampons therefore have frequently been removed and, like the wounds

themselves, generally cleaned very often each day, which has often been very unpleasant for the patients.

Through the invention, these deficiencies are eliminated, or at least largely restricted, and more reliable and more rapid healing is achieved.

The invention initially consists of the fact that in a device for drainage of wounds by means of soft tampons, an open suction line is provided within the tampon, incorporated in an absorbent tampon made from fine-porous and soft-elastic natural, rubber, cellulose sponge, gauze, wadding or the like, or several such suction lines are provided. Because of this, it is possible to draw in and divert the fluid stagnating in the wound more or less strongly, as required, into the sponge tampon. In this way, the secretions that form at the base of the wound or in incompletely developed recesses can never collect, so that the harmful effect of accumulated fluid is also ruled out.

If, in larger tampons, discharge of the suction line into the tampon at several sites is desired, the suction line can be divided after the tampon at a corresponding fork piece into several branches, from which subsequent diversion can occur from a single line, so that only a single suction device is necessary even for larger tampons.

In addition to the mentioned suction line, in another embodiment of the invention, a tube introduced into the tampon or generally penetrating it, or several such tubes can be provided, in order to supply the wound with a liquid that promotes the healing process. Rinsing, disinfection or healing liquids can be considered and, as required, they can be applied with interruptions, in permanent rinsing or permanent drip methods. A suitable liquid, for example, is an agent known under the name Dakin solution. Supply of liquid through such an additional line, subsequently referred to as rinsing line, or several such lines also has the advantage that neither the tampon nor the suction line nor the wound itself can become encrusted, so that the hazard of phlegmon formation and the like is effectively prevented.

Connection of the different lines to the tampon can occur in any desired manner, for example, merely by loose introduction into the tampon, by gluing, during use of rubber by vulcanization or the like of the lines themselves to the tampon. Another embodiment of the invention, on the other hand, can consist of the fact that at the introduction site of the suction line or the rinsing line into the tampon, a tube piece that can be fastened to the tampon by a stitch without damaging the corresponding line is arranged on the line outside of the tampon or only slightly engaging in it.

Another advantageous fastening, also according to the invention, for a line to a tampon is obtained by a plate arranged at the introduction site of

the suction line and/or the rinsing line into the tampon directly or by means of a short tube piece, which, depending on its material, is joined to the tampon by stitching, vulcanization, gluing or the like.

If, in an also inventive manner, this plate is allowed to fully or largely cover the surface of the tampon adjacent to it, the suction effect is also increased by closing off the additional air.

Several practical examples of devices according to the invention are shown in the drawing, and specifically

Fig. 1 shows, partially in section, such a device with a small tampon, as is considered in skull and brain injuries, purely as an example of a suction device schematically indicated with a water jet pump,

Fig. 2 shows a second practical example, depiction as in Fig. 1,

Fig. 3 shows a section along *A-B* of Fig. 1,

Fig. 4 shows a larger device according to the invention, depiction as in Fig. 1,

Fig. 5 shows a partial view of a device according to the invention, which contains a rinsing line, in addition to a suction line,

Fig. 6 shows a partial view of a fastening possibility for a tube to a tampon, partially in section, Fig. 5 and 6, depicted as in Fig. 1, and

Fig. 7 shows a material sectional view used in the drawing.

The tampon is denoted 1, which can consist of any suitable material, for example, very soft elastic rubber sponge (natural or synthetic rubber), foam rubber, viscose (cellulose) or natural sponge, gauze or wadding or any other soft, expediently fine-porous material that can also be absorbent, the entire suction line is denoted 2. One end or several ends, depending on the requirements and size of the tampon, are introduced one to several centimeters into the tampon material and are open within the tampon 1 (see the end opening 3 and/or the side opening or side openings 4) and, with a free end, connected to any suitable suction device, for example, a water jet pump 5, which is supplied pressurized water at 17, an electric pump or the like.

The tampon can naturally have any shape, depending on the shape of the wound; merely to provide a view in the direction of the suction line discharge, only a single such shape is therefore drawn in Fig. 3, and this is purely an example.

Figs. 1 to 3 show a suction line ending only at one location of the tampon. In the variant according to Fig. 1, the suction line, designed as a flexible tube 6, in the interest of protecting the wound, ends directly as such a tube in the tampon. In the variant according to Fig. 2, the suction line ends in the tampon with a tube 7 made of rigid material, for example, hard rubber, synthetic resin, chemically resistant metal, glass or the

like, and the tube line 6, after any suction device, for example, 5, is first connected to this rigid tube 7.

Instead of just one suction line, a tampon, as required, can also be equipped with several complete suction lines 2 in any distribution, in which a separate layout of the individual suction lines can be advantageous, if suction of different strength is to occur at different locations of the wound (as previously, since a multiplication of the lines relative to Fig. 1 to 3 is not expressly shown).

In the variant according to Fig. 4, several, for example, three, suction line discharges are provided in the tampon, which, in the depicted practical example, consist of tubes 8, and these tubes 8 are connected to the arm 9 of the fork piece 15, to which a tube 6 leading to a suction device is then connected, in turn. Such a device can naturally also be designed with only two or with more than three connection sites on the tampon in any distribution. Here again, it is not absolutely necessary to provide parts 8 made of a flexible tube, and the fork piece 15 with its arms 9 can also extend rigidly into the tampon (as previously, not actually drawn), or a fork piece 15 with the rigid small tube 7 can be connected to the corresponding inlet tubes by tube intermediate pieces.

In the practical example according to Fig. 5, in addition to the suction line 2, a rinsing line 10 is also provided. In the depicted practical example, this passes completely through the tampon, and therefore has direct access to the wound; if required, however, it can also end within the tampon. In this variant, the end of both the suction line 2 and the rinsing line 10 on the tampon side can be designed arbitrarily as a flexible tube or a rigid tube. In the variant according to Fig. 5, any number of suction lines or suction line discharges and/or rinsing lines could be provided.

The movement directions of the fluids in the different lines are marked with arrows in the drawing.

In the variants according to Fig. 1 and 2, it is assumed that the tube 6 or tube 7 is merely introduced loosely into the tampon material. A rubber tube 6 can be vulcanized in a rubber tampon, for example, at 11, and the connection can also occur by gluing. In the practical example depicted in Fig. 4, short tube pieces 12 are applied to the tubes 8 or corresponding rigid tubes, for example, vulcanized, glued or, especially in rigid tubes, loosely pushed on, and these tube pieces 12 can be connected to the material of the tampon by seam 13 without having to damage the tubes 8 or 6. With corresponding choice of material, connection to tampon 1 can also occur by vulcanization or gluing.

In the practical example according to Fig. 6, a plate 14 is positioned on the tube 2, for example, vulcanized, glued or the like, and this plate is connected to the tampon by vulcanization, gluing, stitching or the like. The plate 14 can be directly

connected to part 2, for example, loosely pushed on, vulcanized, glued, soldered or the like, or, as shown with a dash-dot line in Fig. 6, provided with a tube-like intermediate piece or corresponding sleeve, again denoted 12. In Fig. 6, in conjunction with the dash-dot extension 14 of Fig. 3, the plate 14 covers the surface 16 of tampon 1 adjacent to it almost completely and, in so doing, largely seals it from drawing in of additional air and, because of this, makes the suction effect relative to the wound more effective.

Each of the shown practical examples can be provided with all such fastening arrangements. Rinsing lines 10 or the lines together with the end of the suction lines 2 can be fastened on the tampon in any of these ways.

The wounds can be drained with the described device and wound fluid of any type, including thicker deposits, like pus can be drawn through the tampon and conveyed out of the tampon as a result of the present and effective suction device, not merely capillarity. The other effects of the tampon mentioned in the introduction are also fully retained. A very practical aid and treatment device is thus made available to the physician, which makes him capable of influencing any secreting wound, especially serious purulent processes of all types, in a very effective way, stopping suppuration and causing the wounds themselves to heal.

Claims:

1. Device for draining of wounds by means of soft tampons, characterized by an open suction line (2) or several such lines within tampon (1) incorporated with one end in tampon (1) made of an expediently fine-porous and soft-elastic natural, rubber, foam rubber, cellulose sponge, gauze, wadding or the like.
2. Device according to Claim 1, characterized by the fact that the suction line (2) after tampon (1) is divided into several branches (for example, 9, 8) through a multibranch fork piece (15).
3. Device according to Claim 1 or 2, characterized by a tube (10) introduced into tampon (1) or passing through it, or such a tube (10) or such a tube (10) (rinsing line) for supplying rinsing, disinfection or a healing fluid to the wound.
4. Device according to one of the Claims 1 to 3, characterized by the fact that a short tube piece (12) that can be fastened to the tampon (1) by the stitch (13) without damaging the corresponding line is arranged on the

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line at the introduction site of the suction line (2) or rinsing line (10) into tampon (1) outside of it or only slightly engaging in it.

5. Device according to one of the Claims 1 to 4, characterized by a plate (14) arranged on the introduction site of suction line (2) or rinsing line (10) into tampon (1) directly or by means of a short tube piece (12), which,

depending on the material, is joined to the tampon (1) by stitching, vulcanization, gluing or the like.

6. Device according to Claim 5, characterized by the fact that the plate (14) fully or largely covers the surface (16) of tampon (1) adjacent to it.

1 page of drawings appended

